Claims

[c1] A computer aided bone densitometry system comprising:

an x-ray source and detector opposable about a patient to produce signals indicating x-ray attenuation by bone of the patient;

a computer receiving the signals and executing a stored program to:

(a) control the x-ray source and detector to signals for a plurality of points over a scan area;

(b) calculate, for the plurality of points, a bone mineral data set indicating x-ray attenuation caused by bone;

(c) measure the bone mineral data set to evaluate the likelihood that acquisition of the signals was faulty; and

(d) output an indication of faulty acquisition when the acquisition of signals is likely faulty.

[c2] The computer aided densitometer of claim 1 wherein the measurement of the bone mineral data set compares peak attenuations in the bone mineral data set with an expected peak attenuation to detect faulty acquisition caused by foreign objects with high density.

[c3] The computer aided densitometer of claim 1 wherein the measurement of the bone mineral data set detects patient motion causing faulty acquisition.

[c4] The computer aided densitometer of claim 3 wherein the measurement of the bone mineral data set calculates discontinuities in bone edges to detect patient motion.

[c5] The computer aided densitometer of claim 3 wherein the measurement of the bone mineral data set calculates jumps in density within a bone to detect patient motion.

[c6] The computer aided densitometer of claim 1 wherein the measurement of the bone mineral data set detects mispositioning of the scan area on the patient causing faulty acquisition.

[c7] The computer aided densitometer of claim 6 wherein the measurement of the bone mineral data set calculates a difference between the location of bones

represented by the bone mineral data set and an expected location of the bones to detect mispositioning of the scan area on the patient.

[c8] The computer aided densitometer of claim 6 wherein the measurement of the bone mineral data set detects mispositioning of the scan area with respect to the vertebrae of the spine.

[c9] The computer aided densitometer of claim 6 wherein the measurement of the bone mineral data set detects mispositioning of the scan area with respect to the proximal femur.

[c10] The computer aided densitometer of claim 1 wherein the patient is supported horizontally on a table and wherein the scan area encompasses the spine wherein the measurement of the bone mineral data set detects excessive displacement of the spine from a center of the table causing faulty acquisition.

[c11] The computer aided densitometer of claim 1 wherein the patient is supported horizontally on a table and wherein the scan area encompasses the spine wherein the measurement of the bone mineral data set detects angulation of the spine from parallel with a long axis of the table causing faulty acquisition.

[c12] The computer aided densitometer of claim 1 wherein the patient is supported horizontally on a table and wherein the scan area encompasses the spine wherein the measurement of the bone mineral data set detects mispositioning of the spine with respect to a supporting surface of the table causing faulty acquisition.

[c13] The computer aided densitometer of claim 1 wherein the scan area covers the proximal femur and wherein the measurement of the bone mineral data set detects separation between the femur and the pelvis to detect mispositioning of the patient trunk with respect to the patient's leg causing faulty acquisition.

[c14] The computer aided densitometer of claim 1 wherein the scan area covers the proximal femur and wherein the measurement of the bone mineral data set detects lack of soft tissue reference areas causing faulty acquisition.

[c15] The computer aided densitometer of claim 1 wherein the scan area covers the

proximal femur and wherein the measurement of the bone mineral data set detects the measured area of the neck region of the femur.

[c16] A computer aided bone densitometry system comprising:

an x-ray source and detector opposable about a patient to provide signals indicating x-ray attenuation by bone of the patient;

a computer receiving the signals and executing a stored program to:

(a) control the x-ray source and detector to acquire signals for a plurality of points over a scan area;

(b) calculate, for the plurality of points, a bone mineral data set indicating x-ray attenuation caused by bone;

(c) accept operator input to define portions of the bone mineral data set for quantitative measurement;

(d) compare the operator input to an input automatically derived from the bone mineral data set; and

(e) output an indication if the operator input deviates from the automatically derived input by more than a predetermined amount.

[c17] The computer aided densitometer of claim 15 wherein the operator input defines intervertebral locations for vertebral height and bone mineral density measurement.

[c18]

A computer aided densitometry system comprising:

an x-ray source and detector opposable about a patient to provide signals indicating x-ray attenuation by tissue of the patient;

a computer receiving the signals and executing a stored program to:

(a) control the x-ray source and detector to acquire signals through a patient for a plurality of points over a scan area;

(b) calculate, for the plurality of points, a bone mineral data set indicating x-ray attenuation caused by bone;

(c) analyze the bone mineral data set to produce a value indication of bone health;

(d) compare the value indication of bone health to a standard range of values; and

(e) output an indication to the operator that the indication of bone health may be erroneous if the value indication is outside the standard range.

[c19]   The computer aided densitometer of claim 18 wherein the indication of bone health is bone density and wherein the program further accepts from an operator patient information selected from the group consisting of patient gender, patient age, patient height, and patient weight and wherein the standard range is adjusted according to the patient information.

[c20]   The computer aided densitometer of claim 18 wherein the indication of bone health is vertebral height and wherein the program further accepts from an operator patient height and wherein the standard range is adjusted according to the patient height.

[c21]   The computer aided densitometer of claim 18 wherein the indication of bone health is vertebral height and wherein the standard range is adjusted according to the measurement of adjacent vertebra of the patient.

[c22]   The computer aided densitometer of claim 18 wherein the indication of bone health is vertebral height and wherein the standard range is adjusted according to the measurement of average of other vertebra of the patient.